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**Method of updating user card in cellular radio system**

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ORIGINAL  
COMPLETE SPECIFICATION  
STANDARD PATENT

Invention Title:

"METHOD OF UPDATING USER CARD IN CELLULAR RADIO SYSTEM"

The following statement is a full description of  
this invention, including the best method of  
performing it known to us:-

This invention relates to cellular radiocommunication systems with terminals (also called mobile stations). In the cellular radiocommunication field, one is particularly acquainted in Europe with the GSM standard ("public radiocommunication Group special Systems Mobile operating in the 900 MHz band").

5 More particularly, the invention concerns a method of updating data between at least two user cards in a cellular radiocommunication system, each user card cooperating with a separate terminal. The method of the invention can particularly, but not exclusively, be used in a GSM system.

10 Generally, a cellular radiocommunication system is used within a geographic network of cells covered by mobile stations (or terminals). A base station is associated with each cell, and a mobile station communicates through the base station associated with the cell in which it is located.

15 "Mobile station" or "terminal" (the two terms being used interchangeably in this description) means the physical equipment employed by the user of the network to gain access to the telecommunication services available. There are different types of terminals, such as the mobiles mounted on vehicles, portable terminals or even hand-held terminals.

20 Generally, when a terminal is employed by a user, the user has to insert a user card which he has in his possession, so that the card provides his subscriber number to the terminal. Thus, in the GSM case, the user card which the user has to insert in the terminal is a removable memory card, called a SIM (Subscriber Identity Module), which provides the user's International Mobile Subscriber Identity (IMSI) to the terminal.

25 In other words, all personal information concerning the subscriber is stored on the user card (or SIM card). Every terminal can therefore be used, in the general case, with any user card.

As well as the subscriber's number, the user cards are made to store data specific to the user, such as for example lists, short messages, etc.

The invention concerns a method of updating such data between at least two user cards.

30 The invention therefore applies for example to the case where the operator provides the user with the possibility of having the use of at least two user cards for the same subscription. This possibility is very attractive since it allows the user to use at

least two active terminals continuously with regard to the network (for example a mobile terminal mounted on a vehicle and a hand-held terminal). In fact, each terminal which cooperates with a particular user card can in this case be used without any particular handling by the user (notably without the user inserting in the terminal a user card which previously was inserted in another terminal).

In that case, as a result of their linking to the same subscription, the two user cards are made to store common data.

Furthermore, the data stored on the user card may be altered for various reasons. For example, the operator can impose a period of validity, on the expiration of which any user card has to be returned to the operator who will supply the user with a new user card in exchange. If the user possesses two user cards, the operator may nevertheless provide him with only one new user card, for example because the two cards do not have the same validity period. Consequently, the user has to recopy one way or another the content of the new user card onto his other new card in order

that the latter constitutes a "second new user card".

Similarly, while using a terminal, new data (for example, short messages or service information) are stored on the user card cooperating with that terminal. If the user possesses another active terminal, the user card which is cooperating with the latter must be updated, i.e. it has to receive the new data in order to store these data. In fact, the user has to be able to use both his terminals interchangeably and consequently both user cards linked to his two terminals must contain the same data.

The invention also applies, according to another example, to the case of separate users wishing to simultaneously update data, also known as common data, on their user cards.

Therefore it is advisable to provide a uniform method of updating common data on several user cards.

In other words, when the common data stored on a user card are updated, the method must permit the common data stored on another user card to be updated in an identical way.

In order to update data between two user cards, the simplest known method consists in a double acquisition of the common data. In other words, during updating, the common data are initially written onto the first user card then written onto the

second user card. This first solution has the major disadvantage of taking a long time and being tedious to carry out. Furthermore, if the errors occur during the double acquisition, the data stored on both cards are no longer identical, which can cause problems in controlling the use of the terminals.

- 5           A second known technique, which aims to offset the drawbacks of the above-mentioned known method, consists in providing at least one of the terminals with means of copying the contents of one user card. Thus, when a second user card containing the same data as a first user card is wanted, the first user card is placed in the terminal equipped with the copying means and then the copy function is activated.
- 10          Operation of this copy function is as follows: first the terminal reads and temporarily stores the data stored on the first user card; then the first user card is withdrawn from the terminal and is replaced by the second user card; finally the terminal writes the data from the first user card into a memory of the second user card.

15           This second known technique has the advantage of allowing a priori an error-free copy of a user card's contents. On the other hand, it has the major disadvantage of requiring the user to handle both user cards and to have them cooperate one after the other with one of the two terminals (the one with the copy function).

            The particular aim of the invention is to compensate for this major disadvantage in the state of the art.

20           More precisely, one of the objectives of this invention is to provide a method of updating data between at least two user cards in a cellular radiocommunication system, the method requiring no handling of user cards on the part of the user.

            An additional objective of the invention is to provide such a method which is capable of being updated even if the two terminals with which the user cards are  
25           cooperating are remote from one another.

            Another objective of the invention is to provide such a method which enables updating in real time and therefore ensures a quasi-permanent equality between the data stored on the two user cards.

30           Yet another objective of the invention is to provide such a method which allows automatic updating.

            According to the invention, there is provided a method for updating data between at least two user cards in a cellular radiocommunication system, the said user

cards storing common data, the said method being of the type which, when common data stored on one of the said user cards (called first user card) are updated, consists in updating in an identical way the common data stored on the other of the said user cards (called second user card), the said first and second user cards cooperating respectively with a first and second terminal of the cellular radiocommunication system, wherein said method comprises the steps of:

- the first terminal reads the updated common data stored on the first user card;
- the first terminal transfers the updated common data, that it has read, to the second terminal;
- the second terminal receives the updated common data transferred from the first terminal;
- the second terminal replaces the old common data stored on the second user card with the received updated common data.

Thus, in order to update data between two user cards, the general principle of the invention consists in carrying out a transfer of the data between the two terminals with which the two user cards are cooperating.

In this way, the method of the invention requires no handling of the user cards on the part of the user. In fact, updating of the data can be performed while the card is left inserted in its terminal.

No data acquisition operation is otherwise required of the user. Consequently, the method of the invention allows a priori an error-free copy of the contents from one user card to another.

In addition, the method of the invention can be implemented even if both terminals with which the user cards are cooperating are remote from one another. In fact, the data transmission between the two terminals merely implies that the terminals are able to communicate together.

Preferably, updating of common data stored on the first user card consists either in replacing an old first user card with a new first user card, or in storing at least one new piece of common information on the first user card.

User card replacement is for example imposed by the operator on expiry of a validity date. Otherwise, storage of new data consists in storing a short message or

any other service data or operation data (changing a list, in particular).

In a preferred first mode of implementing the invention, the said first terminal transfers the updated common data and the second terminal receives the updated common data by using a Short Message Service (SMS).

5 In a second preferred mode of implementing the invention, the said first terminal transfers the updated common data and the second terminal receives the updated common data by using a Data Transmission Service.

Thus, in these two preferred modes of implementing the invention, the data transmission service employed (SMS or DTS) allows the two terminals to communicate  
10 with each other independently of the usual functions provided by the terminals.

Both these services (SMS and DTS) are for example implemented according to the techniques described in the GSM Recommendations Series 2, 3, 4 and 7. In both cases, the network has to have appropriate routing means at system level.

Advantageously, the said method is performed automatically at defined instants  
15 according to a predetermined updating strategy.

Advantageously, the said predetermined updating strategy consists in updating the common data stored on the second user card on each occasion that the common data stored on the first user card are updated.

Thus the method according to the invention permits real time updating of data  
20 between user cards. This ensures therefore a quasi-permanent equality between the data stored on the two user cards.

Preferably, the said method includes a preliminary step of providing a command to the first terminal to transfer updated common data which are stored on the first user card. Advantageously, the said transfer command is entered by a user of  
25 the first terminal on a man-machine interface (such as a keyboard for example) included in or linked to the first terminal.

Preferably the said step, in which the second terminal replaces the old common data, is preceded by a step of supplying an update command to the second terminal to update the common data which are stored on the second user card.  
30 Advantageously, the said update command is entered by a user of the second terminal on a man-machine interface (such as a keyboard for example) included in or linked to the first terminal.

During these two additional steps, i.e. that of providing a transfer command to the first terminal and that of providing an update command to the second terminal, it is therefore the user who controls the progress of the process on each of his two terminals.

5           The invention also concerns the terminals which allow the above-mentioned method to be implemented.

Preferably, the said first terminal includes first updating means which comprise:

- read means for reading data to be copied on the first card;
  - transfer means for transferring the data to be copied, and which has been
- 10       read by the first terminal, to the second terminal.

Preferably the said second terminal includes second updating means which comprise:

- receive means for receiving data to be copied and which has been transferred from another terminal;
  - write means for writing data to be copied and which it has received, onto the
- 15       second user card.

Advantageously, the same terminal includes the said first and second updating means so as to be capable of either updating another terminal or being updated by another terminal.

20           In order that the invention may be readily carried into effect, embodiments thereof will now be described in relation to the accompanying drawings, in which:

- Figure 1 shows a simplified flow chart of a preferred form of design of the method according to the invention; and
  - Figure 2 shows a block diagram of a preferred form of design of a set of two
- 25       terminals and their associated user cards, which enable the method of the invention to be implemented.

The invention thus concerns a method of updating data between a first and second user card CU1 and CU2 respectively in a cellular radiocommunication system, both of these user cards storing common data.

30           Generally, when common data stored on the first user card CU1 are updated, the method consists in updating in an identical way the common data stored on the second user card CU2.



The first and second user cards CU1 and CU2 cooperate respectively with a first and second terminal T1 and T2 in the cellular radiocommunication system.

Figure 1 shows a simplified flow chart of a preferred mode of design of the method according to the invention. In this preferred mode of design, the method includes in particular the following successive steps:

- the first terminal T1 reads (11) the updated common data D stored on the first user card CU1;
- the first terminal T1 transfers (12) the updated common data D, which it has read, to the second terminal T2;
- the second terminal T2 receives (13) the updated common data D transferred from the first terminal T1;
- the second terminal T2 replaces (15) the old common data stored on the second user card with the updated common data D received by the second terminal T2.

This method is for example performed automatically on each occasion that the common data stored on the first user card are updated.

Figure 2 shows a block diagram of a preferred mode of design of the first and second terminals T1, T2 cooperating with their associated first and second user cards CU1, CU2.

The first terminal T1 includes first update means 21 comprising:

- read means 22 for reading data to be copied D in a storage area 29 of the first user card CU1;
- transfer means 23 for transferring the data to be copied D, which has been read by the read means 22, to the second terminal T2.

The second terminal T2 includes second update means 24 comprising:

- receive means 25 for receiving data to be copied D which has been transferred from the first terminal T1;
- write means 26 for writing data to be copied D into a storage area 30 of the second user card CU2.

The storage areas 29 and 30 are for example identified by the user using a man-machine interface (such as a keyboard for example) included in, or linked to, the corresponding terminal.

In Figure 2, each terminal T1, T2 includes only the first updating means 21 or the second updating means 24. This corresponds to the situation where the data are always updated first on the first user card CU1 before being copied onto the second user card U2.

5 It is obvious that the invention also relates to the case where each terminal includes the first and second updating means presented above. Thus, each terminal can just as easily update another terminal as be updated by another terminal.

In the flow chart in Figure 1, the method also includes two additional steps, viz:

- a preliminary step (10) supplying a transfer command to the first terminal T1
- 10 to transfer updated common data which are stored on the first user card CU1; and
- a step (14) supplying an update command to the second terminal T2 to update common data which are stored on the second user card CU2. This step (14) precedes the step (13) of replacing the old common data by the second terminal T2.

The transfer command is for example entered by a user of the first terminal T1 on a man-machine interface, such as a keyboard 27 for example, included in the first terminal T1. The update command is for example entered by a user of the second terminal T2 on a man-machine interface, such as a keyboard 28 for example, included in the second terminal T2. This update command could also be transmitted, for example, from the first terminal T1.

20 According to one variant, the man-machine interfaces, such as keyboards for example, which allow transfer and update commands to be entered, are not incorporated in the first and second terminals respectively but are linked to the latter. In other words, the user can enter the commands from equipment (for example PC-type microcomputers) linked to its terminals.

25 The transfer step (12) by the first terminal T1 and the receive step (14) by the second terminal T2 for transferring and receiving updated common data D are carried out by using a particular communication medium 31, viz: either a Short Message Service (SMS) or a Data Transmission Service (DTS).

30 Both these services are defined in particular in the GSM Recommendations Series 2, 3, 4 and 7. SMS is a service which allows the sending, without prior reservation of resources, of messages to the terminals through a specialised server. The DTS, like the Voice Transmission Service, relies on the opening of traffic

connections with a prior resources reservation for each one.

For operation of the method of the invention, the SMS is for example employed in the following way: the first terminal transmits to the specialised server the coordinates of the second terminal as well as the updated common data to be transmitted, then the specialised server sends short messages intended for the second terminal and containing the updated common data D.

For operation of the method of the invention, the DTS is for example employed in the following way: the first terminal establishes a traffic connection with the second terminal, then transmits the updated common data D to the second terminal through this traffic connection.

Four possible situations can now be identified:

- Situation N° 1: both user cards are user cards with the same subscription and have the same number;

- Situation N° 2: both user cards are user cards with the same subscription and have the same number, but two separate subnumbers (such subnumbers exist for example in an Integrated Services Digital Network);

- Situation N° 3: both user cards are user cards with the same subscription but each has a separate number corresponding to a distinct transmission type (for example, voice transmission for one, and data transmission for the other);

- Situation N° 4: the two user cards are user cards with different subscriptions.

In Situation N° 1, the DTS cannot be used since both user cards with the same subscription have the same number. On the other hand, the SMS may be used as follows:

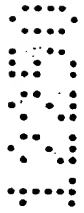
- in a first phase, the second terminal is disconnected from the network and the first terminal transmits the coordinates of the second terminal, as well as the updated common data to be transmitted, to the specialised server;

- in a second phase, the first terminal is disconnected from the network and the second terminal receives from the specialised server the short messages which are intended for it and which contain updated common data D.

In Situations N° 2 and 3, the SMS and DTS can both be used alike. In fact, in both these situations it is possible to make use of the plurality of numbers (or subnumbers) in order to have simultaneously a transmit number (or subnumber) and a

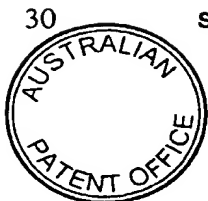
receive number (or subnumber). For both the SMS and DTS, the system has of course to be adapted so as to detect and allow such a particular routing between two numbers (or subnumbers) with the same subscription.

In Situation N° 4, the SMS and DTS may both be used alike.



The claims defining the invention are as follows:

- 1 A method of updating data between at least two user cards in a cellular radiocommunication system, the said user cards storing common data, the said method being of the type in which when common data stored on one of the said user cards, called the first user card, is updated, the method comprises identically updating the common data stored on the other of the said user cards, called the second user card, the said first and second user cards cooperating respectively with a first and second terminal of the cellular radiocommunication system, the said method includes the following steps:
  - the first terminal reads the updated common data stored on the first user card;
  - the first terminal transfers the updated common data that it has read to the second terminal via the cellular radiocommunication system;
  - the second terminal receives the updated common data transferred from the first terminal;
  - the second terminal receives the updated common data stored on the second user card with the received updated common data.
- 2 A method as claimed in Claim 1, wherein updating of the common data stored on the first user card consists in either replacing an old first user card with a new first user card, or storing at least one new item of common information on the first user card.
- 3 A method as claimed in either of Claims 1 or 2, wherein the said first terminal transfers the said updated common data and the said second terminal receives the said updated common data by using a Short Message Service.
- 4 A method as claimed in either of Claims 1 or 2, wherein the said first terminal transfers the said updated common data and the said second terminal receives the said updated common data by using a Data Transmission Service.
- 5 A method as claimed in any one of Claims 1 to 4, wherein it is performed automatically at defined instants as determined by a predetermined updating strategy.



- 6 A method as claimed in Claim 5, wherein the said predetermined updating strategy consists in updating common data stored on the second user card on each occasion that the common data stored on the first user card is updated.
- 7 A method as claimed in any one of Claims 1 to 6, wherein it includes a preliminary step supplying a transfer command to the first terminal to transfer updated common data which are stored on the first user card.
- 8 A method as claimed in Claim 7, wherein the said transfer command is entered by a user of the first terminal on a man-machine interface included in or linked to the first terminal.
- 9 A method as claimed in any one of Claims 1 to 8, wherein the said step, in which the second terminal replaces the old common data, is preceded by a step of supplying an update command to the second terminal to update the common data which are stored on the second user card.
- 10 A method as claimed in Claim 9, wherein the said update command is entered by a user of the second terminal on a man-machine interface included in or linked to the second terminal.
- 11 A terminal of a cellular radiocommunication system, the terminal being of the type which cooperates with a first user card,
- said terminal including first updating means comprising:
- read means for reading data to be copied on the first user card;
  - transfer means for transferring via the cellular radiocommunication system the data to be copied, which has been read by the read means to the second terminal;
- by the read means to the second terminal;
- said first updating means allowing updated data stored on the first user card to be copied onto a second user card, the updated data being common to the said first and second user cards, and the second user card cooperating with another terminal.
- 12 A terminal of a cellular radiocommunication system, the terminal being of the type which cooperates with a second user card,



said terminal including second updating means comprising:

- receive means for receiving data to be copied which has been transferred via the cellular telecommunications system from another terminal;

- write means for writing data to be copied, which it has received, onto the second user card;

the said second updating means allowing updated data, which are stored on another user card, called a "first" user card, to be copied onto a second user card, the said updated data being common to the said first and second user cards, and the said first user card cooperating with the said another terminal.

10 13 A terminal as claimed in Claims 11 and 12, including said first and second updating means so as to be capable of either updating another terminal, or being updated by another terminal.

14 A method substantially as herein described with reference to Figures 1 - 2 of the accompanying drawings.

15 15 A terminal substantially as herein described with reference to Figures 1 - 2 of the accompanying drawings.

**Dated this 12th day of April 2000**

**Alcatel**

**by its attorneys**

**Freehills Patent Attorneys**



## ABSTRACT

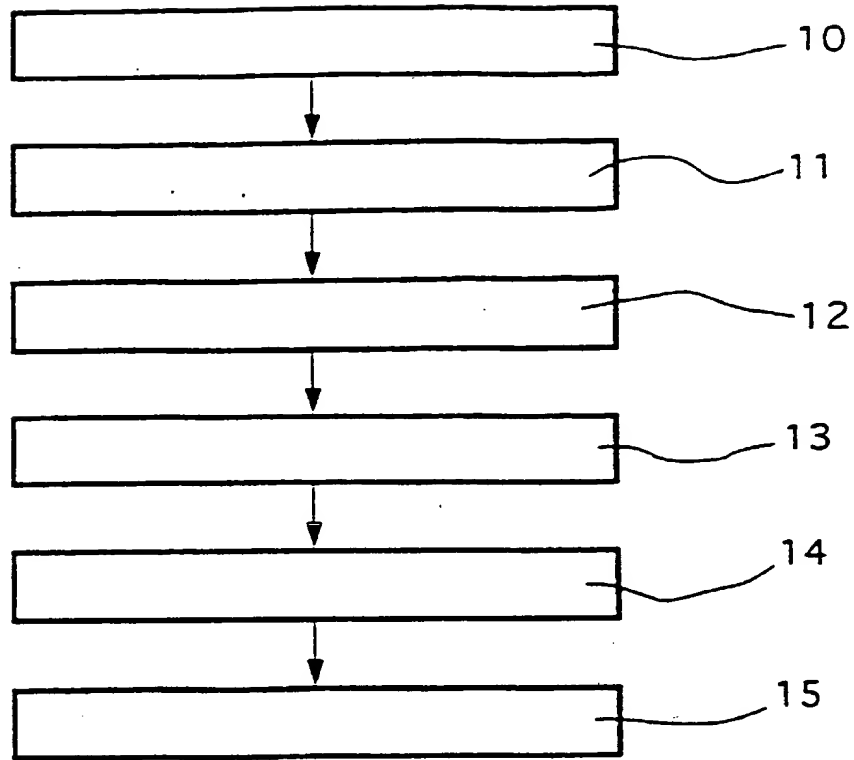
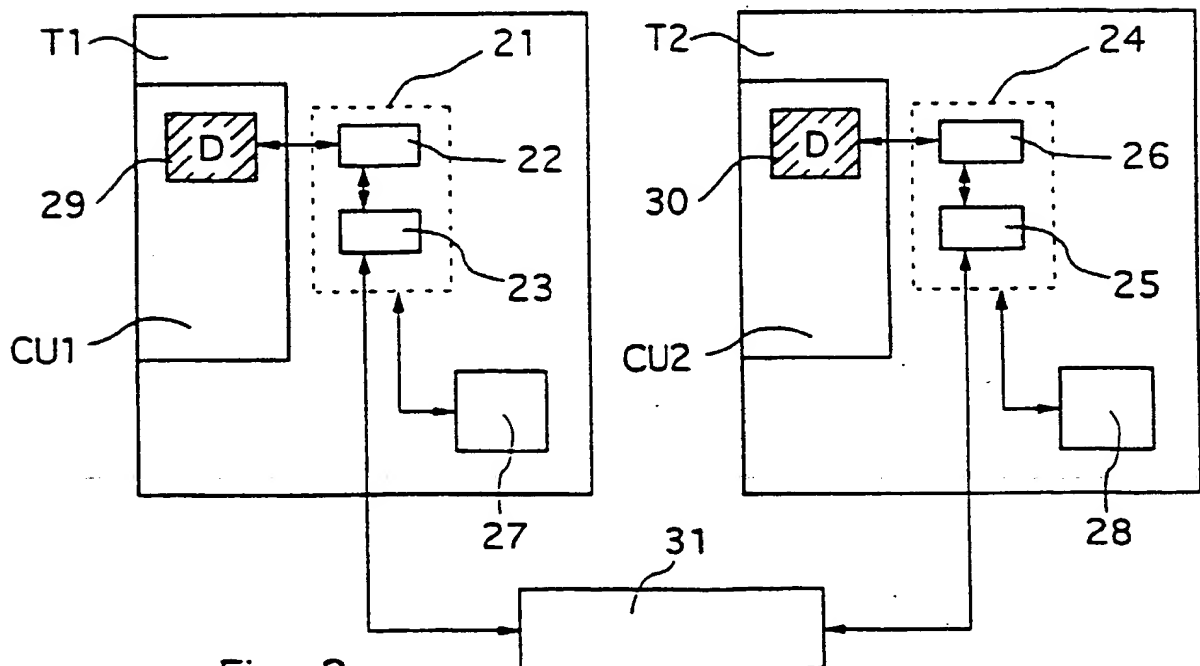
A method of updating data between at least two user cards (CU1, CU2) of a cellular radiocommunication system, the user cards cooperating respectively with a first and second terminal (T1, T2). According to the invention, the method includes following successive steps:

- the first terminal reads the updated common data stored on the first user card;
- the first terminal transfers the updated common data, which it has read, to the second terminal;
- the second terminal receives the updated common data transferred from the first terminal;
- the second terminal replaces the old common data stored on the second user card with the received updated common data.

Advantageously, the transfer and receive steps for transferring and receiving the updated common data are carried out by using a Short Message Service or a Data Transmission Service.

FIGURE TO BE PUBLISHED: Figure 2.



Fig. 1Fig. 2

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